AirCard® 800 Series Wireless USB Modem

Installation Guide

Includes:

- 875U
- 880U
- 881U

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Rev 1.2

SIERRA WIRELESS
HEART OF THE WIRELESS MACHINE®

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6,339,405	6,359,591	6,400,336	6,516,204	6,561,851
6,643,501	6,653,979	6,697,030	6,785,830	6,845,249
6,847,830	6,876,697	6,879,585	6,886,049	6,968,171
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Consult our website for up-to-date product descriptions, documentation, application notes, firmware upgrades, trouble-shooting tips, and press releases:

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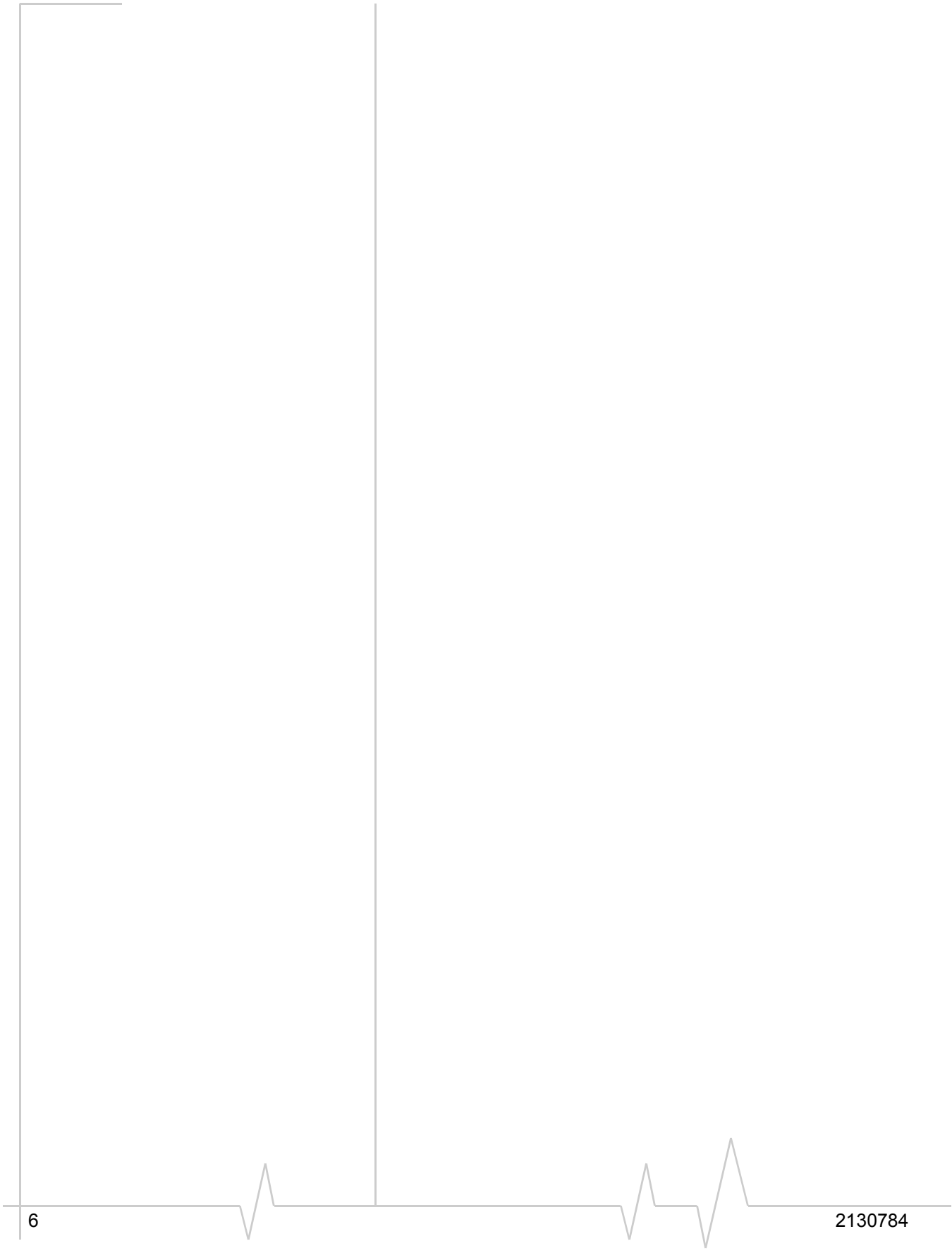
Revision History

Revision number	Release date	Changes
1.2	May 16, 2007	• Revised Guide to encompass the 880U and 881U in addition to the 875U. • HSUPA is now supported. • MAC OS X 10.4 and later are supported. • Windows NT, 98, and Me are no longer supported. • Simplified AirCard USB modem removal process. • Added FCC and IC ID numbers for the 880U and 881U.



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1: Welcome to the AirCard 800 Series wireless USB modem

- AirCard 800 Series wireless USB modem
- Your account and coverage area
- AirCard USB modem software
- Package contents

AirCard 800 Series wireless USB modem

The AirCard 800 Series 3G wireless USB modem enables you to connect to the Internet, send and receive e-mail, connect to a corporate network / VPN, or view streaming video, without the need of a network cable or phone line.

Caution: Do not insert your AirCard USB modem into the USB slot before installing the software.

The AirCard USB modem fits into the USB slot on your notebook or desktop PC.

Supported operating systems

The AirCard USBmodem works in notebook or desktop PCs running Windows® Vista™, XP, or 2000 or Mac OS® X.

The AirCard USB modem as a network card

The AirCard USB modem can be configured to provide the "always-on" data connection that an Ethernet card or other wired LAN card provides. That is, you can set options in Watcher® (a program that comes with the AirCard USB modem) that cause the AirCard USB modem to establish a network connection whenever you insert it, assuming GSM, GPRS, EDGE, UMTS, or HSDPA/HSUPA[1] service is available. (See "GPRS, EDGE, UMTS, and HSDPA/HSUPA service support" on page 10.) Otherwise, you can configure Watcher to connect only when you click the **Connect** button.

1. HSUPA is only available for the 880U and 881U USB modems.

The AirCard USB modem connection provides access to the Internet. Once the connection is established, you can open your browser and connect to any web site available on the Internet, or access other Internet services (such as e-mail).

GPRS, EDGE, UMTS, and HSDPA/HSUPA service support

GPRS, EDGE, UMTS, and HSDPA/HSUPA are add-on data services to GSM mobile phone networks. The maximum theoretical data speeds when connected on these services are:

- GPRS (General Packet Radio Service)—56 kbps (kilobits per second)
- EDGE (Enhanced Data GSM Environment)—236 kbps
- UMTS (Universal Mobile Telecommunications System)—384 kbps
- HSDPA (High Speed Download Packet Access)—up to 3.6 Mbps (Megabits per second)
- HSUPA (High Speed Upload Packet Access)—up to 2.0 Mbps.

GPRS and EDGE are 2G (second generation) data services. UMTS and HSDPA/HSUPA are 3G (third generation) data services.

When establishing a connection, your AirCard USB modem uses the fastest available service. If, for example, you are using an AirCard USB modem in an area that has GPRS and EDGE service but not UMTS or HSDPA/HSUPA service, the AirCard USB modem connects using EDGE service.

Once the connection is established, you have access to all Internet services.

Frequency band support

Every GSM network operates on one of these radio frequency bands when providing 2G (GPRS or EDGE) service:

- **850 MHz band**—(also called the cellular band) used by some North American service providers
- **900 MHz band**—used by some European service providers
- **1800 MHz band**—used by some European and Asian service providers
- **1900 MHz band**—(also called the PCS band) used by many North American service providers

Every network that offers 3G UMTS/HSDPA/HSUPA service does so on one of these bands:

- **WCDMA 850**—used by North American service providers
- **WCDMA 1900**—used by North American service providers
- **WCDMA 2100**—used by European, Asian, and Australian service providers

The AirCard USB modem supports quad-band 850 / 900 / 1800 / 1900 MHz GSM / GPRS /EDGE, and tri-band 850 / 1900 / 2100 MHz WCDMA / HSDPA/HSUPA frequency bands.

Your account and coverage area

Note: If you purchased the AirCard USB modem from a GSM service provider, you may already have an account. Otherwise, your retailer should be able to provide you with the names of companies that provide this service.

Companies that operate GSM networks and provide access to those networks are called service providers. You must have an account with a GSM service provider that offers HSDPA/HSUPA or UMTS service to use the AirCard USB modem's 3G capability. (The AirCard USB modem is backward compatible to 2G service.)

When you obtain your account, you are given a SIM card, also called a "smart card" or "smart chip". (Depending on how you purchased your AirCard USB modem, you may already have an account, and your SIM card may have been included in your package.) The SIM card contains account information and must be inserted in the AirCard USB modem anytime you use it.

Before you can use the AirCard USB modem, you must install the AirCard USB modem software and ensure that your AirCard USB modem is configured to use your account. Instructions on completing these steps are provided in the chapters that follow.

Once installed and configured, you can connect to the Internet with the AirCard USB modem in any area in which you can obtain GPRS, EDGE, UMTS, or HSDPA/HSUPA service.

Your ability to obtain service depends on these factors:

Note: The fee for service is usually higher when you are "roaming" (connected to a network other than the one belonging to your service provider).

- **Proximity to a GSM network**—You must be within the coverage area of a GSM network in order to use the AirCard USB modem.
- **Service provider**—If you are within the coverage area of a network that is not operated by your own service provider, you can obtain service only if there is a roaming agreement between your service provider and the network operator.

- **Account provisions**—Your account may restrict your usage to certain networks or limit the amount of time you can use the network.
- **Frequency band**—You cannot connect to networks operating in bands not supported by your AirCard USB modem, regardless of roaming agreements or account provisions.

Most service providers have coverage maps on their web sites.

AirCard USB modem software

The AirCard USB modem comes with the following software (made by Sierra Wireless):

- The Watcher program for Windows that you use to manage the AirCard USB modem and monitor your connections .
- The driver software that forms the interface between the network card and your Windows operating system.

Package contents

Your AirCard USB modem package contains the following:

- AirCard USB modem
- Rechargeable battery
- Docking cradle with attached cable (inclusion dependent on service provider)
- Installation CD containing the AirCard USB modem software for Windows and this installation guide
- Quick Start Guide

2: The SIM card and your account

2

You require a GSM account and a SIM (Subscriber Identity Module) card to use the AirCard USB modem. The SIM card is a small chip (about the size of a postage stamp) that you insert into the AirCard USB modem. The SIM contains account information used by the network to validate your access.

Note: Without a valid SIM card and a valid account, your AirCard USB modem will not work.

Depending on how you purchased your AirCard USB modem, you may already have an account. In this case, the SIM should be included in your package. Otherwise, your retailer should direct you to a local company that provides GSM service.

To activate an account, the service provider needs from you:

- Billing information (such as a credit card number) used to collect payment for your network usage
- Possibly the IMEI (International Mobile Equipment Identity), depending on your service provider. This number, printed on the AirCard USB modem box and on the AirCard USB modem label, identifies your device (AirCard USB modem model) on the GSM network.

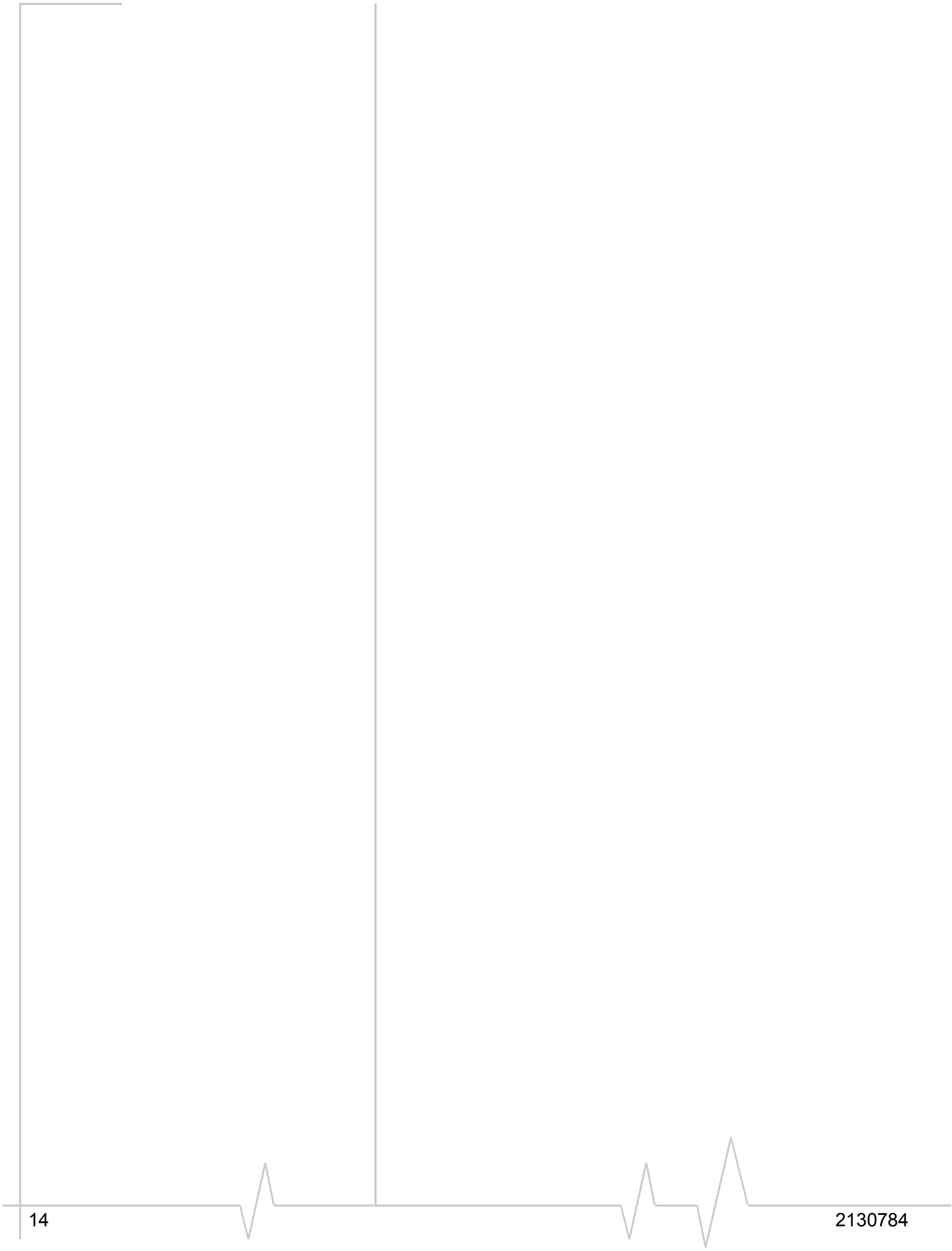
Note: Keep a written record, in a secure place, of the account information that your service provider gives you. Instructions on creating a profile are in the section "Configure your account" on page 23.

Your AirCard USB modem must be configured to use your account. If purchased from a service provider, your AirCard USB modem may have been pre-configured. Otherwise, you must set up a profile in Watcher. Instructions on setting up a profile are described in Chapter 4 on page 23.

If you change GSM service providers (such as if you move to a new city), you will need a new SIM card from your new service provider. You will also need to set up a new profile.

For information on installing the SIM card, see "Insert the SIM card" on page 16.

For information on removing the SIM card, see "Remove the SIM card" on page 21.



3: Installation

- Before you begin
- Install the AirCard USB modem
- Remove the AirCard USB modem
- Remove the SIM card

This chapter guides you through the steps necessary to install the AirCard USB modem on a notebook or desktop computer.

Note: Do not insert the AirCard USB modem into your USB slot before installing the software.

Before you begin

1. Obtain a GSM account (if this wasn't done when you purchased the AirCard USB modem).
2. Ensure that your PC meets the system and hardware requirements described below.

System requirements

The AirCard modem is supported on:

- Windows Vista
- Windows XP (Home and Professional versions)
- Windows 2000
- Mac OS X 10.4 or newer

To install the AirCard USB modem, you require these system resources:

Table 3-1: System resource requirements

USB slot	1 USB slot
Disk drive	CD-ROM (for installation only)
I/O resources	1 IRQ, 40 bytes I/O space
Memory	32 MB

Install the AirCard USB modem

The main steps are:

1. Insert the battery into the modem.
2. Insert the SIM card.
3. Install the Watcher software.
4. When instructed to do so, insert the AirCard USB modem into the USB slot.
5. Configure the AirCard USB modem to use your account (unless it was pre-configured).
6. If your Internet browser is configured to use a dial-up modem, you may need to set the browser to use a network card.

Insert the battery

Caution: *A risk of explosive exists if the battery is replaced by an incorrect type. Dispose of batteries according to the instructions on the battery.*

To insert the battery into the AirCard USB modem:

1. Slide the front panel off the AirCard USB modem.
2. Hold the battery so that the side with two white arrows faces up and the gold contact points on the end of the battery line up with the gold contact points on the modem. Insert the battery into the AirCard USB modem.
3. If you also need to install a SIM card, proceed to the next section, "Insert the SIM card". Otherwise, slide the front panel onto the AirCard USB modem, and push it gently until the panel clicks in place.

For additional battery information, see page 33.

Insert the SIM card

To install your SIM card into the AirCard USB modem:

Note: To prevent the SIM from becoming jammed in the AirCard USB modem slot, ensure the edge of the SIM is smooth before inserting it. Do not attach labels to your SIM as this may also cause it to become jammed.

1. If your SIM card is attached to a larger card, detach the SIM card and remove any fragments stuck to it.
2. If you haven't already done so, slide the front panel off the AirCard USB modem.
3. Slide the SIM card slot cover to the OPEN position and lift the cover.

4. Insert the SIM card, with the gold contact points facing down.
5. Close the SIM card cover and slide it into the LOCK position.
6. Slide the front panel onto the AirCard USB modem, and push it gently until the panel clicks in place.

Install Watcher software and the AirCard USB modem

Note: Users of Windows 2000 must be logged in with administrative privileges. Users of Windows XP may require administrative privileges.

Note: If you are running Mac OS X, please refer to the Quick Start Guide for Watcher Lite in the Support section of www.sierrawireless.com. The following applies only for Windows users.

Note: If you are running Windows 2000, Windows Installer Redistributable 2.0 must be installed. This is available on the Microsoft web site, www.microsoft.com.

Note: You may require your Windows CD. Ensure you have the CD before proceeding.

1. Insert the Installation CD into your CD-ROM drive. The CD should autostart and display a menu.

   If the CD does not autostart, select **Start > Run** and enter **d:\setup.exe** where **d** is the drive letter of your CD-ROM drive.
2. From the CD start-up menu, select your language, then **notebook installation**, and then the link under **notebook software installation** to launch the installer.
3. Use the **Next** and **Back** buttons to navigate through the installer.
4. If the battery and the SIM card are not already inserted in your AirCard USB modem, insert them. ("Insert the battery"and "Insert the SIM card" on page 16.)
5. When prompted to do so, insert the AirCard USB modem into the USB slot:

a. Slide the lever on the back of the modem, in the direction indicated by the triangle, to release the modem's USB connector.

Figure 3-1: USB connector

b. Adjust the USB connector to the desired angle. The USB connector is adjustable to a 90, 135 or 160 degree angle.

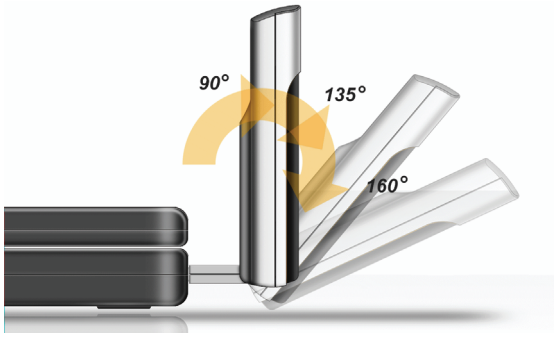


Figure 3-2: USB connector adjustments

c. Gently insert the modem into the USB slot. (Alternatively, you can attach the docking cradle to your computer's USB slot, and insert the AirCard USB modem into the docking cradle.)

Note: Do not forcefully insert the AirCard USB modem. This may damage connector pins. If you have more than one USB slot, you may obtain better signal strength using the top slot.

Figure 3-3: Correct way to insert the AirCard USB modem

Note: If your computer's USB slot is vertical, use the docking cradle. Do not insert the AirCard USB modem into a USB hub or a USB slot on a keyboard.

Warning: *Do not insert the AirCard USB modem as shown in the following illustrations.*

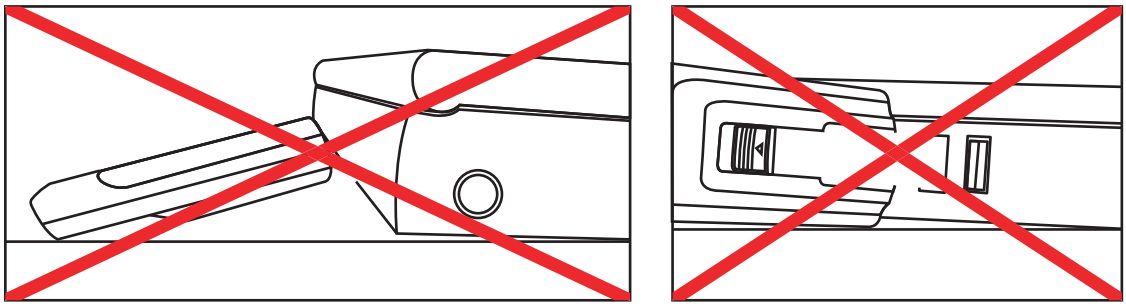


Figure 3-4: Wrong way to insert the USB modem

Note: A red PWR LED indicates that the battery is not fully charged. The battery begins charging when you insert the AirCard USB modem into the USB slot. You can continue to use the modem while the battery is charging. If the PWR LED is red, it is best to leave the modem in the USB slot until the battery is fully charged and the LED turns green. (This should take about an hour.)

Set Internet Explorer to use the AirCard USB modem

If you are using Internet Explorer as your browser, and it is set to connect to the Internet through a dial-up modem, you must set it to use a LAN (local area network) card.

To set Internet Explorer version 5 or 6 to use a LAN, follow these steps:

1. In Internet Explorer, select **Tools** > **Internet Options**.
2. Click the **Connections** tab.
3. Click **Setup** to run the Internet Connection wizard.
4. Follow the steps in the Wizard.

Remove the AirCard USB modem

To remove the AirCard USB modem:

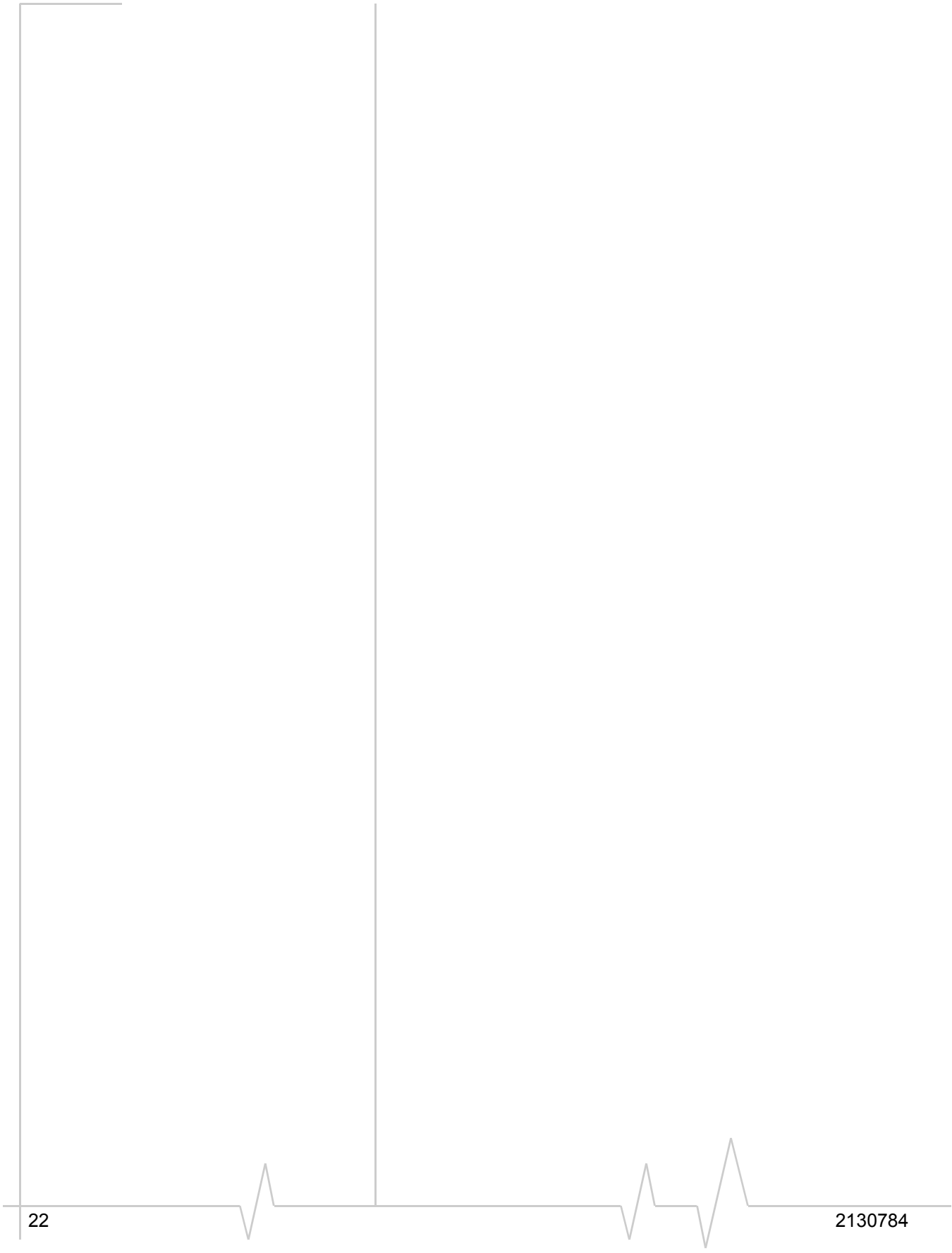
1. Close Watcher if it is open.

2. Gently remove the modem by gripping both sides and pulling it straight out.

Remove the SIM card

To remove the SIM card:

1. Slide the front panel off the AirCard USB modem.
2. Slide the SIM card slot cover to the OPEN position and lift the cover.
3. Remove the SIM card.
4. Close the SIM card cover and slide it into the LOCK position.
5. Slide the front panel onto the AirCard USB modem, and push it gently until the panel clicks in place.



4: Configure your account

• Set up a profile

Profiles contain account information used by the AirCard USB modem to establish connections. At least one profile must be set up on the AirCard USB modem before you can use it. The profile(s) may have been stored on the AirCard USB modem before you purchased it. Otherwise, your service provider should give you all the information you need to set up the profile(s) you require.

Depending on your service provider, some or all of this information must be entered into your profile:

- User Name
- Password
- APN (Access Point Name)
- IP (Internet Protocol) Address (if the address is not automatically assigned by the network)
- Use of IP header compression
- DNS (Domain Name Server) address or addresses

Your service provider may give you only one APN, in which case you require only one profile. Some service providers assign separate APNs for separate purposes. For example, some service providers supply one APN to use for Internet browsing and a different APN to use with a VPN. In this case you must set up multiple profiles. The AirCard USB modem allows for up to sixteen profiles.

Most service providers have one or two standard profiles that all or most of their subscribers are expected to use. Most of these standard profiles have been pre-defined in Watcher, allowing you to select a standard profile, rather than creating it manually.

One of your profiles must be set as the “default” profile. This is the one that is used if you select the **Connect** button without selecting a profile. The default profile is also used if you set the AirCard USB modem to autoconnect when Watcher launches , but only if the connection type for the default profile has been set to autoconnect.

If you are using the AirCard USB modem to access a network that requires you to provide a password each time you connect, you must set the connection mode for your profile to prompt for password (in which case you must connect manually).

Set up a profile

To determine whether you have a profile:

1. Insert the SIM into the AirCard USB modem if it is not already inserted. (See "Insert the SIM card" on page 16.)
2. Insert the AirCard USB modem into the USB slot.
3. If Watcher is not running, start Watcher by selecting **Start > Programs > Sierra Wireless >3G Watcher > 3G Watcher**

   or double-clicking the desktop shortcut .

   If Watcher detects that no profile has been set up, you are prompted, "Would you like to configure a profile now?" Select **Yes**.

   If this prompt does not appear, your AirCard USB modem may have been preconfigured. You can verify that you have a profile by selecting **Tools** > **Connections** to access the **Profiles** tab of the Connections window, which lists all profiles.

To create a profile:

1. On the Connections window, Click the add button and click **WWAN profile**.
2. If you want to use a pre-defined profile, in the **Profile Name** field, select the profile from the drop-down list. Then skip to Step 5.
3. Complete the fields in the Profile window by entering a **Profile Name** (any meaningful description of the profile, such as the name of your service provider) and **User Name**, **Password**, and/or **APN**, if applicable.
4. Select whether you want to make connections automatically or manually, or whether you are required to provide a password each time you make a connection:
   - If you select **Autoconnect** for the default profile, a connection is established automatically whenever you insert the AirCard USB modem.
   - If you select **Manual**, you must select the **Connect** button on the main Watcher window to make a connection.
   - If you select **Prompt for Password**, you must select **Connect** and enter a password to make a connection. Use this option if you have an external device that provides a time-scheduled secure password for your corporate network.
5. If you want to set Watcher to launch your Internet browser, VPN, or any other program automatically, or if your service provider specified an IP address or DNS

address(es), select the **Advanced** folder. Otherwise, click **OK** and skip to Step 10.

6. Select the Launch after connecting field, and from the drop-down list, select which application, if any, you want Watcher to automatically launch when a connection is established with this profile:
   - **None**—No application is autolaunched.
   - **Browser**—Watcher autolaunches your default Internet browser.
   - **MS VPN**—Watcher autolaunches a Virtual Private Network (VPN) connection.
   - **Application**—Watcher autolaunches an installed VPN program, or any other program.
7. Complete the appropriate field, depending on the option you chose in the Launch after connecting field:
   - If you selected Browser—in the URL field, type the URL for the web site you want to view on connection (such as www.sierrawireless.com).
   - If you selected Microsoft VPN—in the Microsoft VPN (PPTP) connection field, select the VPN connection from the drop-down list.
   - If you selected Application—in the Application field, enter the path to the program or use the browse button ... to locate the .exe file for the software application you want to autolaunch.
8. If your service provider has given you an IP address, in the **Advanced** folder, click **TCP/IP**. Select **Static IP** and enter the address in the field below. Otherwise select **Dynamic IP**. (This is the default because most networks use dynamic IP addressing.) Use the data compression or IP header compression fields if supported by your service provider.

*Note: Do not select the **Use IP header compression** field unless your service provider is using this compression. The AirCard USB modem cannot maintain a connection if this is enabled but not supported on the network.*

9. If you have a DNS address or addresses, click **DNS Settings** and enter the address(es). (In most cases, it is not necessary to enter a DNS address.)
10. If you have more than one profile, select **Profiles**, and in the Default Profile field, choose the default profile from the drop-down list. (The "default" profile is the one used by the autoconnect feature, if selected, and is also used if you click **Connect** without selecting a profile.)

11. Click **Apply** to save the change without exiting the window, or click **OK** to save the change and exit the window.

5: Watcher basics

- Launch 3G Watcher
- The 3G Watcher window
- Icons and indicators on the main 3G Watcher window
- View options
- Status icons
- Frequency band and network selection

Note: If you are running Mac OS X 10.4 or newer, please refer to the Quick Start Guide for Watcher Lite found in the Support section of www.sierrawireless.com

Watcher is the Windows program that you use to manage and monitor your AirCard USB modem connections. Watcher allows you to:

- Create an account profile. (See "The SIM card and your account" on page 13.)
- Determine signal strength, roaming status, GPRS/EDGE/UMTS/HSDPA/HSUPA availability, and other network connection parameters
- Monitor the status of the AirCard USB modem and GSM service
- Initiate data connections
- Enable or disable SIM security that prevents others from using your SIM card if it is lost or stolen
- Set options related to notifications and the Watcher window

Note: It takes up to 20 seconds for Watcher to become fully functional after launch.

If you set your default account profile to autoconnect (see page 24), you do not need to run Watcher when you use the AirCard USB modem, but Watcher does provide useful status information.

Launch Watcher

Unless the feature has been disabled, Watcher launches automatically anytime you insert the AirCard USB modem. You can also launch Watcher by:

- Double-clicking the desktop shortcut, or
- Selecting **Start > Programs > Sierra Wireless > 3G Watcher > 3G Watcher**

Depending on how your profile is configured, your browser, VPN, or other program may launch automatically anytime you launch Watcher. See page 25.

The Watcher window

*Note: To get help in Watcher, select **Help > Help Topics**. You can also display help by pressing <F1>.*

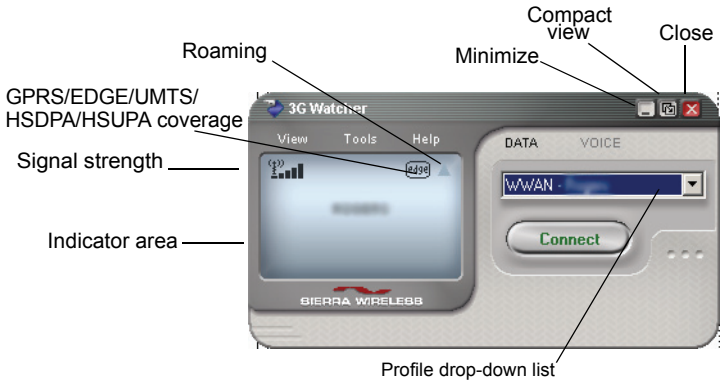


Figure 5-1: The Watcher window.

Icons and indicators on the main Watcher window

These icons are used on the main Watcher window:

Table 5-1: Icons and indicators in Watcher

	Device status. If an icon of the AirCard USB modem with an "X" is displayed, Watcher is unable to detect the AirCard USB modem. This indicates that the AirCard USB modem is not fully inserted into the USB slot or the device is powered down. You may be able to resolve this problem by restarting Watcher, powering up the AirCard USB modem, stopping, ejecting, and reinserting the AirCard USB modem, or restarting your PC.
 	Signal strength and service status. The number of bars beside the antenna increases as signal strength increases, to a maximum of five bars. The ToolTip that displays when you position the mouse pointer over this indicator shows the numeric value of the RSSI (Received Signal Strength Indication in dBm). An antenna with a line through it indicates no service is available (Not in Service). You are outside of the coverage area or have insufficient signal strength to maintain a GSM data connection.
Coverage. The icon indicates the fastest service that is: - Available in your current coverage are. - Supported by your modem.	
	• GPRS icon—GPRS (General Packet Radio Service) • EDGE icon—EDGE (Enhanced Data for GSM Evolution) • 3G icon—UMTS (Universal Mobile Telecommunications System) • HSDPA icon—HSDPA (High-Speed Downlink Packet Access)
	• HSUPA icon—HSUPA (High-Speed Uplink Packet Access)
	• HSPA icon—concurrent HSDPA and HSUPA

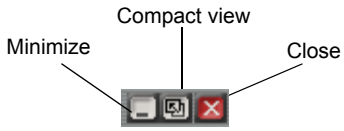
Table 5-1: Icons and indicators in Watcher

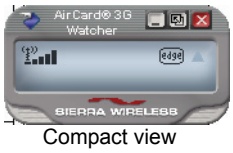
When only the letters are displayed, (for example EDGE), you are within the coverage area, but have not yet acquired the service. When the indicator has an outline (EDGE), you have acquired service and are able to establish a data connection. When the indicator is filled (EDGE), you have a data connection on the wireless service.	
	Roaming. You are connected to a network other than your local service provider's. There may be a surcharge for roaming service. (This service may not be available.)
	New SMS message. Click the icon to open the SMS Express window and read your messages. When your SIM becomes full, this icon flashes and turns red. (Supported only on selected devices.)
	Data transmission. When the modem is connected to the network, the main Watcher window shows you the amount of data received and sent.

View options

You have these options for the Watcher window:

- You can enable/disable “Always on top” from the View menu. When enabled, the Watcher window always appears in front of other application windows.
- You can switch between the full Watcher window and the compact window from the View menu or by using the Compact View button:





Compact view

- You can use the Minimize button to close the Watcher window but leave the program running.

Status icons

These icons appear in the system tray (usually in the lower right corner of your screen).

	Watcher cannot detect the AirCard USB modem. Ensure that the AirCard USB modem is inserted properly and powered on.
	You do not have an active high-speed connection.
	You have an active high-speed connection.
	You have new (unread) SMS messages.

Turn the radio on and off

This option allows you to conserve your computer's battery by turning off the AirCard USB modem radio transmitter/receiver when you are not using it.

To turn off the radio:

1. Select **Tools > Turn Radio Off**.

When the radio is turned off, the menu option switches to Turn Radio On and the message "Radio is off" is displayed in the Watcher window.

To turn on the radio:

1. Select **Tools > Turn Radio On**.

Frequency band and network selection

Watcher has two options that affect your ability to obtain GPRS, EDGE, UMTS, or HSDPA/HSUPA service in any given area. You can select:

- The frequency band you want to use
- The network you want to use, if you are within the coverage area of more than one network

Frequency band selection

Every GSM network operates on one set of frequency bands. (See "Frequency band selection" on page 32.) The AirCard USB modem is designed to change frequency bands automatically as required to obtain network service. You can also change frequency bands manually from the Network tab of the Options window (**Tools > Options... > Network**).

Note: Unless your service provider specifies otherwise, it is recommended that you use the **Auto** *setting.*

Network selection

Depending on your location, you may be within the coverage area of several networks. Your ability to obtain service on each network is dependent on your account.

Your options for network selection are:

- **Automatic**—The AirCard USB modem automatically selects a network based on your account and network availability.
- **Manual**—The AirCard USB modem scans the area and displays a list of detected GSM networks. You can then choose from a list of available networks.

If you select a network on which you cannot obtain service, the message, "Failed to register with network" appears. You should then choose a different network.

This option is set on the Network tab of the Options window (**Tools > Options... > Network**).

6: Care and maintenance of your USB modem

As with any electronic device, the AirCard USB modem must be handled with care to ensure reliable operation. Follow these guidelines when you use and store the AirCard USB modem:

- The AirCard USB modem should fit easily into your USB slot. You may damage the connector pins if you force the AirCard USB modem into a slot.
- When not installed in your computer, store the AirCard USB modem and SIM in a safe place.
- Protect the AirCard USB modem from liquids, dust, and excessive heat.

When you insert or remove the modem, always hold it by the sides.

The modem's USB connector is adjustable to three positions. Do not force the hinge past the last point — this may break the connector. For more information, see the illustration on page 18.

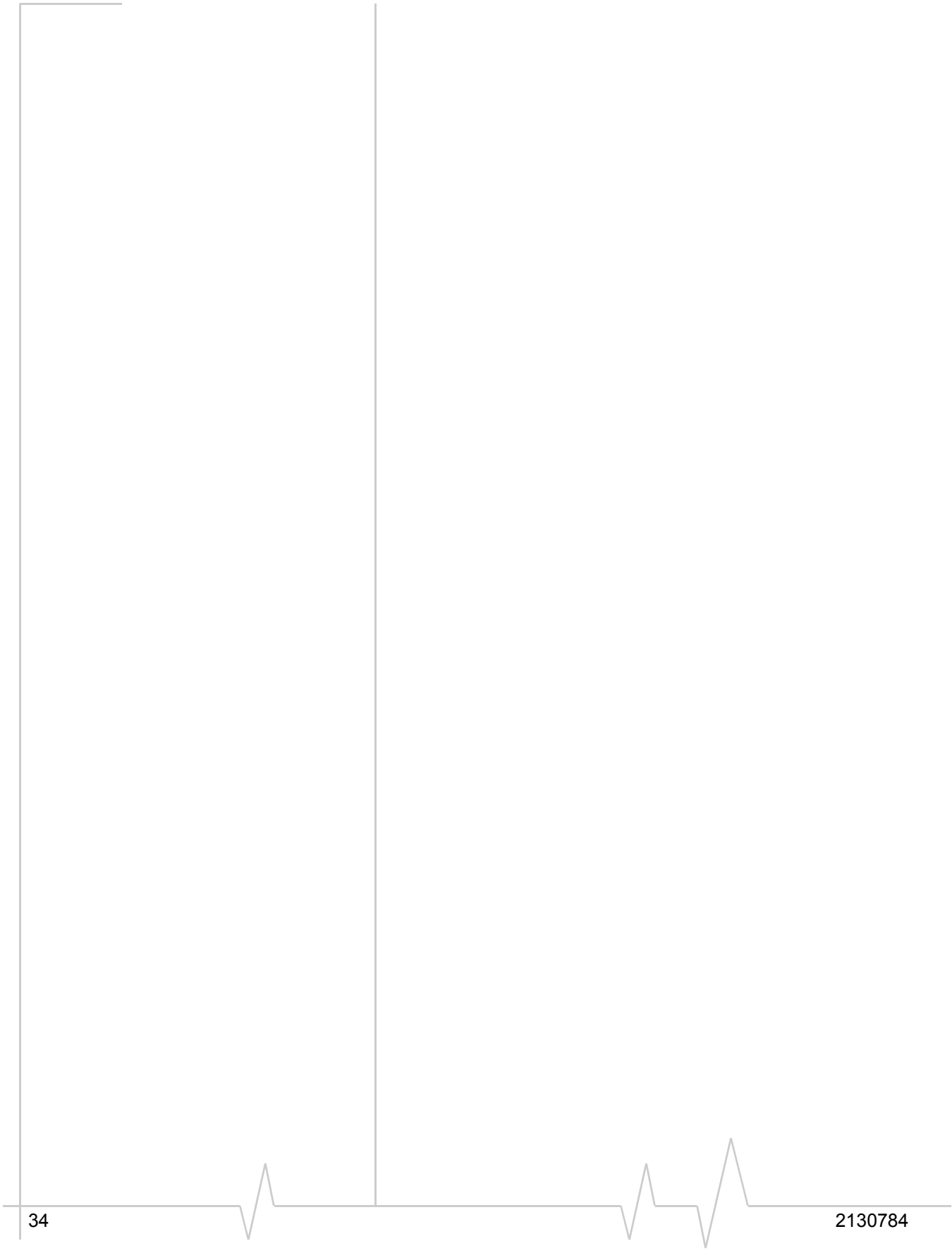
Battery

We recommend that you fully charge the battery before using it for the first time.

Use only Sierra Wireless AirCard USB modem batteries intended for use with this device. Using other batteries and chargers could be dangerous.

Do not let the metal contacts on the battery touch another metal object. Doing so could short circuit and damage the battery.

If the battery leaks or emits an odor, immediately remove it from the proximity of any exposed flame. The leaking electrode could ignite and cause a fire or explosion.



7: Technical specifications

- LED operation
- Radio frequency and electrical specifications
- Environmental specifications

This chapter describes the operation of the LED and provides technical data for the AirCard USB modem.

LED operation

The AirCard USB modem has two LEDs. The LEDs operate as follows:

Table 7-1: LEDs for AirCard USB modem

LED	State	Indicates
Data	**Off**	The modem has no power. You have powered off the modem (TOOLS > Power Off Modem), the modem is not completely inserted into the USB slot, or the computer is in suspend mode (which powers down the modem).
	Solid green	The modem has power, has found a signal, and is ready to connect.
	Green, blinking slowly	The modem is powering up, or no service is available. See the online Help (“Not in Service”).
	Green, blinking rapidly	The modem is sending or receiving data.
PWR	**Off**	The modem has no power. You have powered off the modem (TOOLS > Power Off Modem), the modem is not completely inserted into the USB slot, or the computer is in suspend mode (which powers down the modem).
	Red	The modem has power; the battery is low. The battery recharges whenever the modem is connected to the PC. You can continue to use the modem while the battery is recharging.
	Green	The modem has power.

Radio frequency and electrical specifications

Table 7-2: Radio frequency and electrical specifications for AirCard USB modem

Compliance	GSM Release 5
UMTS bands	IMT 2100 / 850 / 1900 MHz (Band Class I, II, V)
GSM / EDGE bands	850 / 900 / 1800 / 1900 MHz
Channel spacing	200 kHz (GSM) 5 MHz (WCDMA)
Channel raster	200 kHz
Frequency stability	0.1 ppm

Environmental specifications

Table 7-3: Environmental specifications

Operating temperature	-20°C to +60°C
Storage temperature	-20°C to +85°C
Humidity	85%, non-condensing
Vibration	Random vibration, 10 to 1000 Hz, nominal 6G RMS in each of 3 mutually perpendicular axes. Test duration of 60 minutes for each axis, for a total test time of 3 hours (non-operating)
Drop	1 m on concrete on each of 6 faces, 2 times

8: Regulatory and safety information

- Important notice
- Important safety / compliance information for North American users
- EU regulatory conformity

Important notice

Because of the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (that is, have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless network card are used in a normal manner with a well-constructed network, the Sierra Wireless network card should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless and its affiliates accept no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless network card, or for failure of the Sierra Wireless network card to transmit or receive such data.

Safety and hazards

The AirCard USB modem **MUST BE POWERED OFF** in all areas that may be susceptible to radio interference. In particular:

- Prohibited Areas

  Obey all signs and notices and follow all rules and regulations. Power off the AirCard USB modem when instructed to do so or when you suspect that it may cause interference or danger.

- Where explosive atmospheres may be present

  Areas with a potentially explosive atmosphere are not always clearly marked. Such areas include gas stations, fuel depots, chemical transfer or storage facilities, areas where blasting is in progress, areas where the air contains chemicals or particles such as grain, dust, or metal powders, and any other area where you would normally be advised to turn off your cellular phone or vehicle engine.

- Near medical or life-support equipment

  In areas where medical equipment may be susceptible to any form of radio interference. In such areas the AirCard USB modem can transmit signals that could interfere with this equipment.
- On board aircraft

  In addition to Federal Aviation Authority (FAA) requirements, many airline regulations state that you must suspend wireless operations before boarding an aircraft. The AirCard USB modem is capable of transmitting signals that could interfere with various onboard systems and controls.

  Failure to observe this instruction may lead to suspension or denial of cellular telephone services to the offender, legal action, or both.

  Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. The AirCard USB modem may be used normally at this time.
- While operating a vehicle

  The driver or operator of any vehicle should not use a wireless data device while in control of a vehicle. Doing so detracts from the driver or operator's ability to control and operate the vehicle. In some countries, using such communications devices while in control of a vehicle is an offence.

Important safety / compliance information for North American users

Caution: *Unauthorized modifications or changes not expressly approved by Sierra Wireless, Inc. could void compliance with regulatory rules, and thereby your authority to use this equipment.*

The design of the AirCard USB modem complies with U.S. Federal Communications Commission (FCC) and Industry Canada (IC) guidelines respecting safety levels of radio frequency (RF) exposure for portable devices, which in turn are consistent with the following safety standards previously set by Canadian, U.S. and international standards bodies:

- ANSI / IEEE C95.1-1999, *IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz*

- National Council on Radiation Protection and Measurements (NCRP) Report 86, -1986, *Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields*
- Health Canada, Safety Code 6, 1999, *Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz*
- International Commission on Non-Ionising Radiation Protection (ICNIRP) 1998, *Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields (up to 300 GHz)*

Table 8-1:

875U	FCC ID: N7N-MC8775U IC: 2417C-MC8775U
880U	FCC ID: N7NMC8780U IC: 2417C-MC8780U
881U	FCC ID: N7NMC8781U IC:2417C-MC8781U

Caution: The AirCard USB modem has been tested for compliance with FCC / IC RF exposure limits in the laptop computer(s) configurations with the side loading USB slot and can be used in laptop computers with substantially similar physical dimensions, construction, and electrical and RF characteristics. This USB Modem must not be collocated or operated in conjunction with any other antenna or transmitter. Use of this device in any other configuration may exceed the FCC RF Exposure compliance limit.

These devices comply with Part 15 of the FCC Rules. Operation is subject to the condition that these devices do not cause harmful interference.

Where appropriate, the use of the equipment is subject to the following conditions:

Warning: *(**EMI**) – United States FCC Information – This equipment has been tested and found to comply with the limits pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in an appropriate installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful inter-*

ference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

EU regulatory conformity

Sierra Wireless hereby declares that the AirCard USB wireless network card conform to all the essential requirements of Directive 1999/5/EC:

CE 0682

The Declaration of Conformity made under Directive 1999/5/EC is available for viewing at the following location in the EU community:

Sierra Wireless (UK), Limited
Lakeside House
1 Furzeground Way, Stockley Park East
Uxbridge, Middlesex
UB11 1BD
England

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